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THE MUSHROOM GROWERS'
ASSOCIATION

MGA
BULLETIN

AUGUST, 1953 · NUMBER 44

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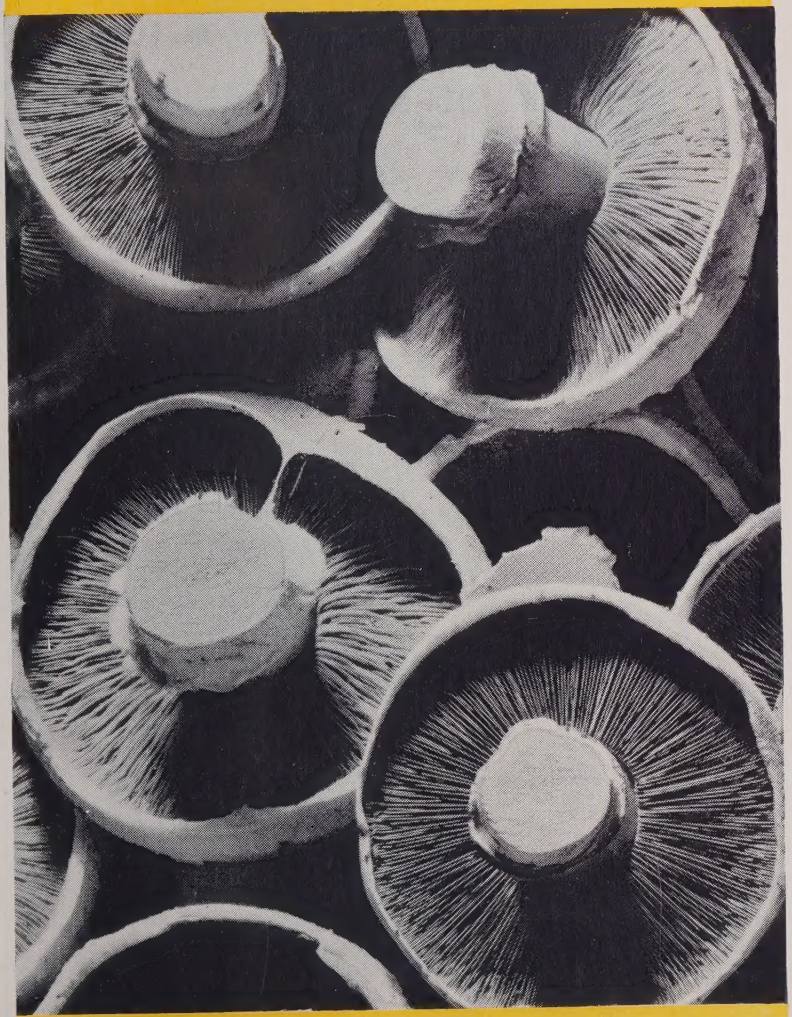

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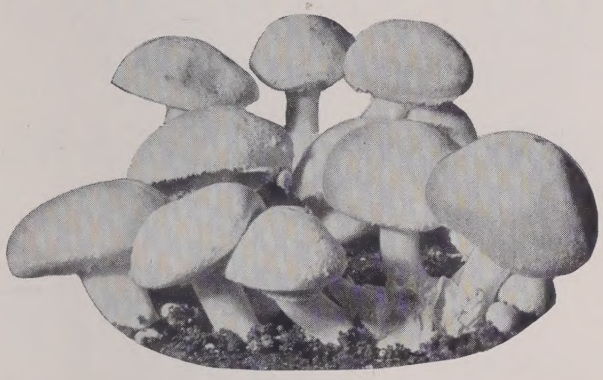

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3%				4%			
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In 1 cwt. lots	80/-	123/-
½ ,, ,,	42/6d.	67/-
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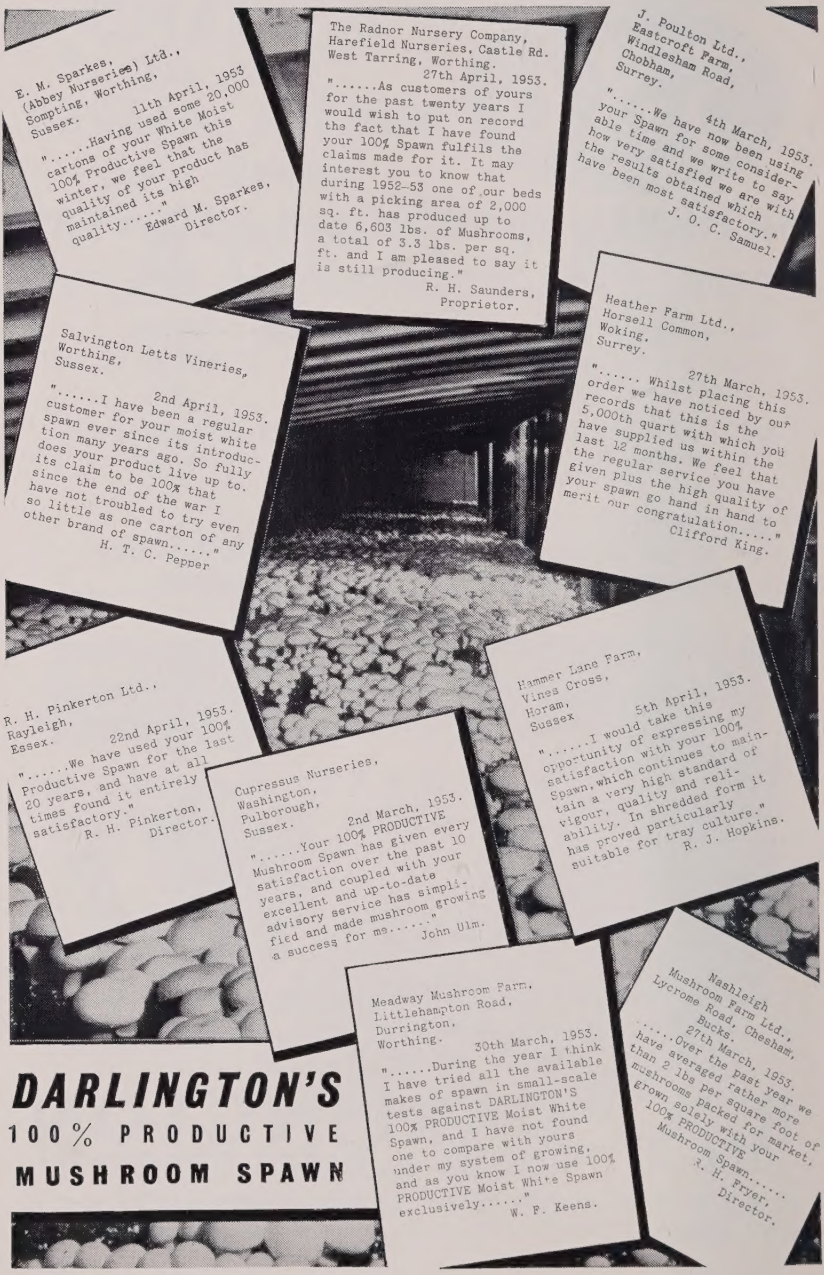

E. M. Sparkes, (Abbey Nurseries) Ltd., Sompting, Worthing, Sussex.
"......Having used some 20,000 cartons of your White Moist 100% Productive Spawn this winter, we feel that the quality of your product has maintained its high quality....."
Edward M. Sparkes, Director.
The Radnor Nursery Company, Harefield Nurseries, Castle Rd. West Tarring, Worthing.
27th April, 1953.
".....As customers of yours for the past twenty years I would wish to put on record the fact that I have found your 100% Spawn fulfils the claims made for it. It may interest you to know that during 1952-53 one of our beds with a picking area of 2,000 sq. ft. has produced up to date 6,603 lbs. of Mushrooms, a total of 3.3 lbs. per sq. ft. and I am pleased to say it is still producing."
R. H. Saunders, Proprietor.
J. Poulton Ltd., Eastcroft Farm, Windlesham Road, Chobham, Surrey.
4th March, 1953.
".....We have now been using your Spawn for some considerable time and we write to say how very satisfied we are with the results obtained which have been most satisfactory."
J. O. C. Samuel.
Salvington Letts Vineries, Worthing, Sussex.
2nd April, 1953.
".....I have been a regular customer for your moist white spawn ever since its introduction many years ago. So fully does your product live up to its claim to be 100% that since the end of the war I have not troubled to try even so little as one carton of any other brand of spawn....."
H. T. C. Pepper
Heather Farm Ltd., Horsell Common, Woking, Surrey.
27th March, 1953.
"..... Whilst placing this order we have noticed by our records that this is the 5,000th quart with which you have supplied us within the last 12 months. We feel that the regular service you have given plus the high quality of your spawn go hand in hand to merit our congratulation....."
Clifford King.
R. H. Pinkerton Ltd., Rayleigh, Essex.
22nd April, 1953.
".....We have used your 100% Productive Spawn for the last 20 years, and have at all times found it entirely satisfactory."
R. H. Pinkerton, Director.
Cupressus Nurseries, Washington, Pulborough, Sussex.
2nd March, 1953.
".....Your 100% PRODUCTIVE Mushroom Spawn has given every satisfaction over the past 10 years, and coupled with your excellent and up-to-date advisory service has simplified and made mushroom growing a success for me....."
John Ulm.
Hammer Lane Farm, Vines Cross, Horam, Sussex
5th April, 1953.
".....I would take this opportunity of expressing my satisfaction with your 100% Spawn, which continues to maintain a very high standard of vigour, quality and reliability. In shredded form it has proved particularly suitable for tray culture."
R. J. Hopkins.
Meadway Mushroom Farm, Littlehampton Road, Durrington, Worthing.
30th March, 1953.
".....During the year I think I have tried all the available makes of spawn in small-scale tests against DARLINGTON'S 100% PRODUCTIVE Moist White Spawn, and I have not found one to compare with yours under my system of growing, and as you know I now use 100% PRODUCTIVE Moist White Spawn exclusively....."
W. P. Keens.
Nashleigh Mushroom Farm Ltd., Lycrome Road, Chesham, Bucks.
27th March, 1953.
".....Over the past year we have averaged rather more than 2 lbs per square foot of mushrooms packed for market, grown solely with your 100% PRODUCTIVE Mushroom Spawn....."
R. H. Fryer, Director.
DARLINGTON'S
100% PRODUCTIVE
MUSHROOM SPAWN

The
MGA BULLETIN

AUGUST · 1953
NUMBER 44

EDITORIAL

An Urgent Reminder

In February last our MRA Chairman, Mr. F. C. Atkins, sent out a letter to all members of the MGA asking them to contribute the funds necessary to keep Research going until the end of this year, when it is hoped that it will be taken over by the Toddington Research Station. Owing to circumstances beyond our control it has not yet been possible to conclude the negotiations.

So far £900 has been forthcoming, but the Board feel that a further £600 is required to maintain the Station for the rest of the year.

As a struggling grower between the years 1930 to 1940 I fairly wallowed in ignorance. Newcomers to the Industry since the war have not suffered this unhappy experience, and I wonder at times if they all appreciate the wealth of information on growing which is now available.

Much of this information comes to them from the MRA and as long as the MRA is there it will continue to come.

Growers have the opportunity, to-day, of putting their problems to the MRA.

The MRA has a world-wide reputation, and it is certain that we are being, and shall be, kept abreast of new discoveries and techniques.

One wonders why support is not more readily forthcoming.

To some, the imminence of being taken over by the Ministry may be the cause of the reduction or the withholding of a subscription.

To others it may be that they feel that the MRA has not done anything for them as yet. This I am inclined to doubt; but in any case they might, to my mind, just as well cancel their fire insurance *because they have not yet had a fire.*

At a time of falling prices and increased expenses, Research is one of the two dominating necessities in our Industry.

The Station is approved and generously supported by the Ministry. It was started by a very few far-sighted growers. Its direction is carried on in the main by growers.

The Directors are not asking for large subscriptions from the few, but small subscriptions from the many.

May this be the last time that we shall have to ask for your support.

G. P. LAWRENCE, *Vice-Chairman, MRA*

ITEMS OF INTEREST

In our February issue we pictured the widely-publicised mushroom *basket* recently introduced by J. Dring Ltd. This well-known packaging firm is now marketing similar baskets ranging from 1 lb. to 6 lb. capacity.

NEW VITAMIN E

I would suggest that our dieticians add the vitamin of Enjoyment to the usual A.B.C. list.

OSWELL BLAKESTON in *John O'London*, 26.6.53.

NEXT SEASON'S FUEL

Glasshouse fuel will be allocated this season on the same basis as last year, when a standard of 180 tons of hard fuel or about 270 tons of coke to the acre was used. *The Grower*, 30.5.53.

WEEK-ENDS PREFERRED

While reading the May Bulletin it occurred to me that some people, of whom I am one, cannot manage to attend functions on any day but Saturdays. This is in reference to Farm Walks, but it also applies to Yaxley Open Days and Refresher Courses. **E. H. PALFREY.**

FARM WORKERS DISSATISFIED

The rates for men are to go up this month by 7s., making a new weekly minimum of £6 for 47 hours—with proportionate increases for women and juveniles.

Mr. E. G. Gooch, president of the National Union of Agricultural Workers, is reported to have commented: *This has not entirely met our claim. We wanted a weekly minimum of* £7.

WHITBY GROWS ITS OWN

Dozens of mushrooms, some ten inches across, were found growing yesterday among rose bushes in a Whitby traffic island near the centre of the town.

Explanations from the Town's Park Department was that recently loads of soil which had contained mushroom spawn *from the Council nurseries* had been dumped on the island.

"YORKSHIRE OBSERVER," 19.6.53.

The italics are mine.—EDITOR.

RECIPE OF THE WEEK

Although the sturdiest of champions for home-cooking, I must admit that on my trips abroad I have always admired the manner in which the mushrooms have been prepared. Apparently the secret is garlic—and there's no need to make a wisecrack about the impossibility of garlic ever remaining a personal secret! Recipe as given to me: Bring the fat in the frying-pan to the hot stage, drop in one bruised clove of garlic, and leave sizzling until it begins to turn brown. Take it out and drop in the sliced mushrooms, cover pan with a tin plate and fry *en casserole*. Simple, but true, and I can assure you, no tang of garlic about the finished article.

BILL SANDFORD in *Fruit Trade Journal*, 19.4.52.

T. M. W. ALEXANDER, B.Sc., of the Research Dept. of *The ECLIPSE PEAT Co. Ltd.*, gives us his views on .....

THE QUALITY OF PEAT

AND ITS APPLICATION TO THE TYPE REQUIRED FOR CASING

The great possibilities of peat as a casing material are becoming obvious, both from recent research and practical results under growing conditions. The advantages are evident of a casing material, free from soil-borne disease, which gives at least as good a crop as most soils and is easier to handle once the " feel " is obtained. It seems that peat is such a material and, moreover, it is available as a constant product in any quantity.

It is, however, imperative for growers to realise that the term ' peat ' covers a very wide range of materials and although a constant ideal material *can* be obtained, great care must be taken in selection of the exact type if the best results are to be obtained. The purpose of this article is to explain how and why peat varies in quality and how to ensure obtaining a satisfactory material.

Why and How Peat Deposits Vary. Peat is formed when the rotting down of dead vegetation on a site is slowed down and finally stopped by the onset of conditions unfavourable to the rotting down organisms. These conditions are mainly increasing acidity and lack of aeration due to waterlogging.

There are two main types of peat bog—the bog where the main factor is very high acidity due to leaching out of the bases in the soil by very high rainfall, this produces the sphagnum peats, composed mainly of mosses. The other type is the valley bog where the main factor is waterlogging and the peat formed is of the much richer sedge type, composed of sedges, rushes and other aquatic plants.

It can be seen that these contrasting conditions lead to very different plants and this, combined with the degree of humification (extent of rotting down) leads to great variation in richness. Peat bogs are often very old (the extensive Somerset sedge deposits are up to 5,000 years of age, varying with the depth) and varying climatic conditions during that time lead to strata of somewhat different sub types which can be a great help to a manufacturer in producing specialised products.

Another important factor is the post formation history of the bog—for instance, the Somerset deposits have water running through them from the adjacent limestone hills and this is the reason for the peat produced from them being less acid than most other peats.

Importance of Skill in Manufacturing Peat Products. Manufacturing is very much more technical than most people imagine. Considerable physical variation of product can be obtained by different methods of manufacture. The richer sedge types lend themselves much more readily to the production of specialised products as the much higher colloid content enables a greater physical variation to be produced from them.

A manufacturer must, therefore, have a thorough knowledge of peat types to enable him to select the best deposit. He must also know the sub types on his bog and their reaction to the different methods of handling them. The differing products are prepared by varying the methods and timing (season, etc.) of digging and drying the peat which can produce blocks varying from the consistency of a hard wood to the softness of cotton wool from the same type of deposit. The varying types thus produced are blended, milled and graded in very specialised mills and machines according to the particular requirement for which the peat is wanted. The product is then packed in bales or bags—where a product with a specialised grading is required, it is better to pack it in bags as the process of baling may damage the grading, or baling may be impossible, due to the required physical properties of the product.

Degree of Variation of the Peat Product. The product can vary physically—in grading (quantity of particles of various sizes), texture (softness, compressibility and fibrosity) and colour (straw yellow to black). It can also vary chemically, in pH—from pH 3·0 to 5·5 (and consequently in lime requirement) and in its constituents:—

Nitrogen	0·3% to 1·5%
Cellulose and Hemi-cellulose	7·0% to 41·0%
Lignin and Lignin-like complexes	19·0% to 59·0%
Actual Lingo *protein*	2·0% to 7·5%

Sedge Peats are generally well humified, stronger physically in nitrogen and colloidal substances, very rich (up to five or six times as rich as many other types), less acid, and when suitably prepared have a granular structure. *This means that even when holding the maximum amount of moisture, and even if they are constantly heavily watered, they still retain their structure and consequently " pore-space " and aeration.* Moss Peats either lack these physical qualities or possess them to a lesser degree.

Points for the Grower to Consider when Buying Peat. One of the most common fallacies about peat is that the value is dependent upon bulk for a given weight. The true criterion is, however, *the crop obtained* from a *unit cost* of peat. This usually bears little relationship to bulk.

The grower would be well advised to buy the peat of an experienced manufacturer who fully understands his specialised requirements. He should buy peat packed in bags as baled peat is more liable to be contaminated and is more likely to have been stored for a long time, leading to over-drying—an extremely important point as over-dried peat can be ruined. It is also much easier to handle bagged peat and, in any case, it seems that the best types and grades for casing are those which will not bale.

It appears from results growers are obtaining that the richer, dark granular grades of peat are giving better crops than the light, spongy types and, moreover, do not seem to require the use of vermiculite (an important economic point!)—this may well be due to their retention of ' pore-space ' when wet and consequent better aeration. Moist peat ' as dug ' should be avoided at all costs as it is usually

obtained from the top *non-sterile* layer of the bog.

Peat is a relatively new material in the hands of the grower but, provided the right peat is used and the grower realises the differences in management, it can provide an efficient and economic aid to mushroom production. Well over 60 growers are now using the dark granular sedge type peat and are reporting extremely promising results.

Toddington Research Station

GOVERNING BODY ANNOUNCED

Announcing the transfer of Cheshunt Research Station and staff to Toddington, near Littlehampton, Sussex, where a start has now been made on the provision of glasshouses and buildings, the Ministry of Agriculture state that the new research institute will promote research on the cultivation of glasshouse crops, *mushrooms*, bulbs, flowers and shrubs grown in the open.

First chairman of the Governing Body will be **Mr. T. Ainslie Robertson,** at present chairman of Plant Protection Ltd.

The members are: **Prof. W. Brown,** M.A., D.Sc., F.R.S., Professor of Botany, London University; **Prof. F. G. Gregory,** D.Sc., F.R.S., Professor of Plant Physiology, London University; **Prof. R. H. Stoughton,** D.Sc., A.R.C.S., Professor of Horticulture, Reading University; **Prof. R. L. Wain,** Ph.D., D.Sc., F.R.I.C., Professor of Agricultural Chemistry, Wye College; **Mr. H. G. Thornton,** D.Sc., F.R.S., Head of the Department of Soil Microbiology at Rothamsted; **Sir Edward J. Salisbury,** C.B.E., D.Sc., Sec. R.S., Director of Kew Gardens; **Mr. C. E. Hudson,** N.D.H., Senior Education and Advisory Officer of the N.A.A.S.; **Mr. L. C. Madsen,** Lea Valley tomato grower, President of the Governing Body at Cheshunt and chairman of the Tomato and Cucumber Marketing Board; **Mr. J. Leeming,** prominent Lancashire grower, governor at Cheshunt and chairman of the Advisory Committee at Fairfield; **Mr. C. J. Horwood,** chrysanthemum grower at Basingstoke; **Mr. Ernest Stevens,** Lea Valley rose specialist; **Mr. E. J. Mount,** well-known grower at Canterbury; and **Mr. W. H. Young,** a pioneer grower in the Worthing area.

The new Institute will take the form of a company limited by guarantee but having no share capital, and it is expected that legal incorporation will be completed by the autumn.

Commercial Grower, 25.6.53.

RESEARCH APPEAL, 1953

The MRA Directors wish to acknowledge their appreciation of the following contributions to the 1953 Fund, which bring the total to £932 11s. 3d.: Thomas Elliott Ltd., £10 10s.; Capt. G. P. Lawrence (*second contribution*) £10; J. Collingridge Ltd., £10; J. R. Oldfield, £10; G. V. Allen, £5 5s.; R. L. McCheane (New Zealand) £2 4s. 3d.; *Bankers' Orders* (*June*) £10.

COPPER SULPHATE—USE WITH CARE

WARNING by Dr. R. L. EDWARDS

Following experiments at the Mushroom Research Station, Yaxley, copper sulphate has been used regularly on a few farms where Truffle had become a regular visitor, with very satisfactory results; the Truffle almost completely disappeared.

Recently one of these farms has experienced another kind of trouble, a dying-back of the mushrooms, with a bacterial attack which is probably secondary, and copper sulphate is one of several factors which may be responsible.

There was no evidence of injury from copper sulphate used in the normal routine of the farm as practised during the past year. When certain other changes were introduced which promoted a more rapid spawn growth in composts treated with copper sulphate, the dying-back was observed, mostly in areas of vigorous spawn growth and fruiting. Damage only occurred when the two factors were present, treatment with copper sulphate and extra vigorous spawn growth. One of the changes leading to the rapid growth of spawn was the introduction of large quantities of live steam at peak-heating, and to a smaller extent during spawn growth. There is no evidence to show whether or not the steam alone, in the absence of copper sulphate, would produce this damage on the farm in question.

The problem is being investigated, but meanwhile the purpose of this note is to warn possible users of copper sulphate that they should not at the same time use drastic methods to promote exceptionally rapid and vigorous growth of spawn.

As with most new practices, **the use of copper sulphate (or live steam) should be introduced carefully, and into one or two crops to gain experience, before adoption throughout the farm.**

Footnote: *From Miss Gandy's article on Copper Sulphate in July Bulletin* 43 (*pp.* 225-6) *was omitted the following table:*

COPPER SULPHATE AS A SELECTIVE FUNGICIDE IN COMPOST

Truffle Forecast		Truffle Observed	
Nil		Nil	
X	= Slight probability	Trace	= Up to 2 patches 3 sq. ft.
XX	= Probable	X	= Up to 6 patches or 2 larger ones
XXX	= Very probable	XX	= Several larger patches

NUMBER OF CROPS IN WHICH TRUFFLE WAS FORECAST AND OBSERVED

Forecast		Observed			
	total	nil	trace	X	XX
Untreated					
Nil	2	1	1	—	—
X	6	2	—	4	—
XX	4	—	3	1	—
XXX	3	1	1	—	1
Treated with copper sulphate					
Nil	1	1	—	—	—
X	1	1	—	—	—
XX	3	3	—	—	—
XXX	4	3	1	—	—

W. L. CHAMBERLIN looks back and asks . . . . . .

Has growing changed so much ?

I first started growing in 1933 with the help of Mr. B. A. Noble, under the supervision of Mr. Hereford, of Marvo Mushrooms Ltd., who was I suppose the leading mycologist in those days.

Our first efforts were a few ridge beds in my cellar from which we got quite a fair crop; then we had more ridge beds in a brick-built outhouse which did very well indeed.

The next move was the erection of a range of American-type houses, and I well remember that the first house to be filled peak-heated in a most wonderful way. The beds (12″ thick) all heated up to about 135° F. and the compost when spawned was all speckled with fire-fang. The asbestos wall sheets all cracked and the ceiling which was of T. & G. boarding buckled up completely!

The crop was a great success, but after having done 2¾ lb. per sq. ft. it suddeny started to fail and Mr. Hereford discovered that the beds were full of eelworms.

It was not long after this that we started growing in foreign egg boxes which were about 6′ × 2′ and 5″ deep. These cost 3d. each. I bought hundreds and used them extensively in the Godstone Caves as well as in the brick-built sheds at Oxted. There was no attempt to peak-heat them, but I well remember one lot was heated up by accident owing to the fact that the house they were intended for was not ready and they were left stacked up in a pile in the turning shed for a couple of days by which time they had peak-heated themselves (except on the outsides) and I think they did about 2½ lb. per sq. ft.

This "accident" taught me a very great deal, chiefly that compost which had fire-fanged during the final fermentation was an encouragement to a good run of spawn and was a great help in killing off any pests.

I am afraid there is not much more of interest I can say about growing in those days except perhaps concerning costs. The best London manure was 18/- per ton delivered, and a man's basic wage was 38/- per week. Casing soil, if bought in, was 4/- per cu. yard.

I used French spawn imported by Mr. Hereford. This was about 2 years before Mr. Gahm came over from America.

On looking back I really do not see that there is very much difference in the methods used 20 years ago as compared with present-day culture. We composted as now (three turns and a peak heat). Soil was sterilised. Ashes and peat were added to the soil. The Tray System was practised then but without the modern Pasteurising House. Another point of interest is that nematodes have only been mentioned in the Mushroom Industry for the past four or five years and yet I was troubled with them in 1933.

I often wonder whether some of our mysterious crop failures in the past attributed to so many various causes may really have been the result of eelworm all the time.

E. H. PALFREY *wants*

MAXIMUM PROFIT—NOT YIELD

A NEW GRAPH DEVISED

Looking through MGA Bulletin 24 again, it occurred to me that I might make a few comments on the use of production graphs to determine the optimum cropping time.

In that Bulletin, F. C. Atkins described how, using shelves, the total crop per house per year depended vitally on the length of time of cropping for each crop. In fact, one might choose a cropping time to maximise this total, and a neat graphical method of doing this was given.

R. L. O. Jackson suggested that an improvement on the answer given by Atkins would be given if, instead of maximising production per year per house, one chose to maximise profits per year per house. He suggested one method which made use of the total value of mushrooms picked in a house; this was plotted against time, and one was able, using a similar neat graphical method as the one above, to decide when the time had come for the house to be turned out. He also used the cost of production up to the time the crop started.

Atkins replied that he thought this system was no improvement as, in watching a particular house graph, one may be hoodwinked by the house giving a " false " peak (easily given if the price varies a lot); as you don't know when you should empty until you do so; and as you empty a week after you should because you want to check your peak. His motto was: Maximum output since it nearly always gives maximum profits.

Jackson counter-replied that prices in fact did not vary as much nor as suddenly as Atkins was trying to make out, and that his method, because it took account of more factors, was the better.

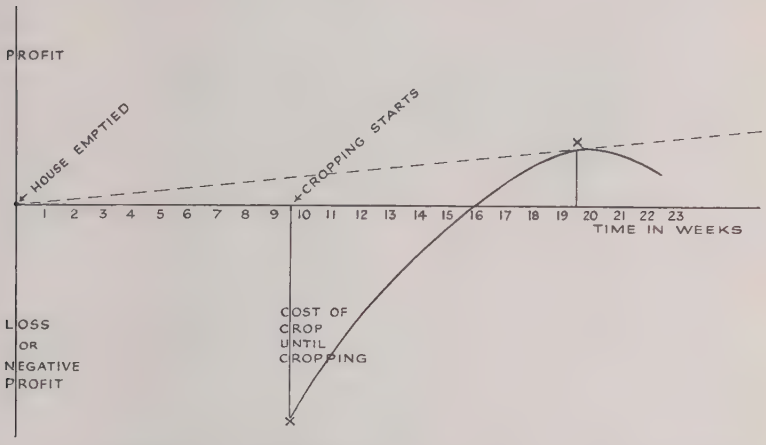
Now both would like maximum profits. Jackson would get them if he knew the prices he would get for the few weeks after he had finished cropping (so that he might avoid " false " peaks) and if profits were not upset by the absence of precise planning for at least a year ahead. Atkins, on the other hand, can be certain that he would not obtain maximum profits over the year.

Which is the better system? Evidently both Atkins and Jackson can test this for themselves for a particular year if they have the records for that year of all their production and all the prices through the year. A certain amount of extrapolation* of production graphs may be necessary but this may be done quite safely if one has seen quite a number of them. R.L.O.J. may do this; F.C.A. won't!! To him, planning is of primary importance.

*Extension of curve or results beyond those recorded, *i.e.* guessing the future.

But a third system suggests itself to me which may be the best. This takes account of Atkins's easily assumed motto and of the non-planning element.

Atkins, despite his experience of widely fluctuating prices over a year, knows there are quite definite seasonal price trends. If we make use of this fact we may be able to plan ahead knowing that, for maximum profit, the cropping time varies with the prices for which mushrooms are sold.


PROFIT
HOUSE EMPTIED
CROPPING STARTS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
TIME IN WEEKS
LOSS OR NEGATIVE PROFIT
COST OF CROP UNTIL CROPPING

We make use of the production graph for the house, the cost up till the time cropping starts, and the accumulative costs while cropping. I have separated these last two to simplify the method. First let us assume a constant price for mushrooms over the cropping period. Now plot profit against time and the result is as follows:

Thus, if we stop cropping after $19\frac{1}{2}$ weeks and empty the house right away, our profits are made as high as they can be.

Now let us see what happens if

(i) *The cost of the crop up till cropping is bigger or smaller.*

From the shape of the graph, by translating it upwards or downwards, we see that if the cost falls we must shorten our cropping time to get the most money from our house; and vice versa.

(ii) *The price of mushrooms is different.*

Here we find a lower price means we ought to shorten our cropping period to get the most money per unit time as profit and to lose the least if we operate at a loss; and vice versa. This assumes a linear increase in accumulated cropping costs.

So if one buys a DLP Composter, and it is found to cheapen composting, given an unchanged cropping graph, one should shorten the cropping time; the same applies to the use of urea instead of blood in synthetic compost. (Take note, F.C.A.!)

Now we may make a few discoveries. For example, if the cost of the crop until cropping is made as low as zero, the time of cropping for maximum profit may be lessened by 2 or 3 days at the most. Or, if the price of mushrooms is 10d. per lb., the time for cropping may be given as only 1 or 2 days less than the time which is best for a price of 5/6d. Then we may safely say that our analysis has concluded that we need not vary our cropping period; and our three arguments would vanish and everyone would be happy.

But if the difference is not negligible we can proceed as follows:

Take 1952 as a test year.

Using 1951, 1950, 1949 . . . . . make an estimate of the price trends through 1952. (Pretend to be unbiassed: or better still get someone to do it who has not worried over the prices in 1952).

Plan the 2 or 3 crops using the above predicted price trends so that the maximum profit is obtained.

Calculate the profit.

Finally calculate the profit which you would have obtained if your price trends were absolutely accurate.

Now compare the profits calculated above with the profit which actually was made.

Thus, for examples:

Actual profit	Profit following plan	Max. possible profit w.r.t.* price fluctuations
(i) £300	£305	£310
(ii) £300	£310	£400
(iii) £300	£450	£500

*Mathematical shorthand for With Respect To.

Then if (i) was the case we would probably be prepared to scrap the idea.

If (ii) turned up we might argue that the maximum profit w.r.t. price fluctuations was great enough to try to get.

If (iii)—well!

And a few notes.

If prices fall until the curve just touches the time axis we have the cropping time for the minimum cost per pound of mushrooms produced. This may be obtained more simply by a direct approach but it is good to know (for those who like the plan outlined) that, as prices fall low, we are minimising our costs in this direction.

This method minimises losses for the times that prices fall below production costs.

Trays may be better served by this method as 5 crops per year will be found to have more widely varying price averages than the 2 or 3 shelf crops per year.

And for those big producers who may find it somewhat (?) difficult to plan a year ahead with houses having 18 weeks, 20 weeks, 21 weeks, 23 weeks periods, why not try a regular time per house which is not based on maximum production but on maximum profit ?

Fred. C. Atkins discusses the . . .

Second International Conference

MEMORABLE DAYS IN BELGIUM

Where there is much desire to learn, there of necessity will be much arguing, much writing, many opinions: for opinion in good men is but knowledge in the making.

JOHN MILTON.

Photo.: Dr. Kurt Lohwag.

The Second International Conference on Mushroom Science, held in Belgium in June, was an enormous success. Such was the variety of subjects discussed that there was something of absorbing interest to everyone.

Socially it did a great deal of good in the pleasantest way possible; we were able to renew old friendships and make many others. It is extraordinarily comforting to know that there is scarcely a country in Europe to-day where the mushroom grower lacks a friend –a friend who will entertain him and talk as long and as late as he wishes on the fascination of the cultivated *Psalliota hortensis* (as we all more or less agreed to call our commodity).

It was from an *organisation* point of view, however, that this Conference was so outstanding. The praise must go equally to Mademoiselle Luce Engels, in Gembloux, and to Monsieur Guy de Man, in Brussels. (I particularly liked the lapel badges, in which our name and country were shown surmounted by a tiny cluster of white-enamelled mushrooms.)

The list of over 30 subjects and speakers has already been published; the papers are now being collected and condensed and will be printed as soon as possible under the heading *Mushroom Science* 2. We hope to be able to keep the price down to 10/- a copy.

At various times there were over 100 growers and scientists at the Conference, from a dozen different countries. The MGA, apparently complacent in the knowledge that even to-day's prices in Britain are higher than almost anywhere else in Europe, sent no official delegate, and from this country went privately six growers only—a very poor show, I thought. The MRA sent Dr. R. L. Edwards and Miss D. G. Gandy.

The opening ceremony on Tuesday, 16th June, in the Academic Hall of the National Institute of Agronomy was performed by Monsieur Mat, Director-General of the Belgian Ministry of Agriculture. The chairman was Professor A. Willam, Director of Mushroom Research in Belgium (Cerec), President of the Conference.

We were welcomed to the Institute by its Rector, Monsieur Tilkin. As President of the 1st International Conference, I was called upon " to say a few words " and, having been forewarned, spoke in my party French of the definite impetus which the Peterborough Conference had given to mushroom research throughout Europe. Which was as good an excuse as any for a round of drinks, generously provided by the Institute.

We got down to serious business on Tuesday afternoon and continued until 11 a.m. on Saturday morning under various chairmen: Prof. Willam (Belgium); Dr. Edwards (Great Britain); Monsieur André Sarazin (France); Monsieur L. Imler (Belgium); Dr. J. W. Sinden (U.S.A.); and myself. We had one break, on the Thursday afternoon, when we went on a coach tour of the lovely Meuse Valley, under the tri-lingual guidance of Monsieur de Man, and as guests of the Belgium Research Station and its Supporters' Club.

The official languages were English and French. Dr. Hauser, able to speak in both tongues, brilliantly summarised each paper in German for the benefit of those who spoke neither!

There was an agreeable Civic Reception on Friday given us by the Burgomaster of Gembloux in his Town Hall. He was thanked for his welcome and his wine by Dr. Edwards (whose French so improved as the days wore on that by the end of the week I had almost given up trying).

Just before mid-day on Saturday, 20th June, we were shown the first-class experiment houses and pasteurizing room at Gembloux by the Cerec staff: Prof. Willam, Messieurs P. Heinemann and T. Autrique, and Mlle. Engels.

At half-past-two the same afternoon we were sitting down to the Banquet de Clôture in the beautifully-decorated Meli Restaurant at Meysse, just outside Brussels. At six o'clock it was at an end. No words of mine can convey the enormous pleasure which the enormous repast brought to us all. It was superb. It was time I returned to Yaxley.

Among my souvenirs is an inscribed bronze medallion presented to each member of the Conference Committee to mark the occasion and also the 30th anniversary of commercial mushroom growing in Belgium.

AFTER THE CIVIC RECEPTION AT GEMBLOUX

Photo.: Dr. Kurt Lohwag.

DR. R. L. EDWARDS describes

Part Two of the Conference

About 70 members of the Conference left Brussels on a bright sunny Monday morning, in two coaches and a string of cars, for the tour of Belgian Limburg and Holland.

Two sets of caves were visited during that morning, both in Belgium. At the first we were told that the hot weather had depressed cropping, and the temperature was unusually high for a cave, being well over 60° F. This temperature in itself would not harm the crop, but the warm weather also has the effect of greatly reducing ventilation, as there is no longer the natural rise of warm air from the cave through the vertical shafts into cooler air outside, which is the main source of ventilation in cool weather and at night. It is, of course, well-known that the summer is a bad cropping period in these caves.

The second cave visited is a most extensive place and, running as it does much further into the hillside, but with better ventilation, it was not so badly affected by the heat and we saw some beautiful flushes of mushrooms on the usual ridge beds about 1 ft. wide. There were also a few flat beds on the floor, which had been laid to use up a little surplus manure quickly, but the grower assured us that they do not give as good yields per ton of manure as the ridges.

This cave has a long main drive in, and transverse galleries have been partitioned off on each side, making units which can be locked up and kept private. A few years ago the village school was housed in one of these side galleries.

After these visits we went on to Maastricht, arriving rather late for an excellent lunch, during which we were entertained with songs by one of the members of the Conference, who is an operatic singer as well as a mushroom grower.

In the afternoon the weather broke, and we drove through Holland in heavy rain, crossing a bewildering number of rivers before we reached Berg en Dal for the night. There, as is usual on such occasions, mushrooms and lighter subjects were discussed with equal readiness until after midnight.

Tuesday morning was misty and overcast, so that we again missed the magnificent view across the valley from Berg en Dal. Our first visit was to the horticultural produce market at Nijmegen, where we saw fruit and vegetables, including mushrooms, being sold by the Dutch auction system. The buyers sit in a tiered sale room facing a dial about 6 ft. in diameter, scaled up to 10 guilders. Each buyer has a numbered push button in front of his seat; the pointer on the dial starts high up on the scale and swings steadily back until a buyer presses his button, when his number is automatically shown on the face of the dial, and the pointer stops at the price he is paying. The swing of the pointer takes only a few seconds, and fresh lots or samples of lots are brought in continuously, so that several hundred lots can be sold in an hour. The speed and efficiency of the proceedings were most impressive.

It was interesting to see that some good quality buttons were sold for 3.10 guilders per kilo (2s. 10d. per lb.), whereas open mushrooms of poor quality only fetched 90 cents (10d. per lb.).

Most Modern Farm in Holland

After admiring some magnificent strawberries and pot plants, checking our own weights, and seeing asparagus graded, we left the market and went on to visit the most up-to-date mushroom farm in Holland. It was built last year by Mr. Derks, using all the information on air-conditioning and insulation available from the Dutch research on these subjects.

The unit consists of a heat room and three cropping rooms and is run on the two-zone or tray system, with a 12-week cycle in each cropping room. The rooms hold 520 trays each, total area 2,600 sq. ft., with a total cubic capacity of 8,600 cu. ft., giving less than 3 cu. ft. of free air space per sq. ft. of bed area. This high rate of filling is made possible by a system of forced ventilation with conditioned air. The air passes through a radiator which can be heated by a coke-fired hot water boiler, or it can be cooled by well water giving a drop of 25° F. if required. The air is also humidified to over 90% R.H. by means of a fine spray, so that the high rate of ventilation does not dry the surface of the trays too much; only light watering is needed. The temperature in the cropping houses can be maintained at 61° F., summer and winter.

(*Photo. : Aug. Hoc et fils*)

THE DELEGATES IN FRONT OF THE GEMBLOUX INSTITUTE

An important factor contributing to the high filling rate of the cropping rooms is that the trays are stacked to within about 1 ft. of the ceiling. This can only be done by having the air inlets in the floor and outlets near the roof. Top inlets were used in some of the earlier Dutch air-conditioned houses, but these cause draughts unless there is a clear space of 3 ft. above the top trays.

The heat room is smaller than the cropping rooms; it is heated by blowing air through a radiator inside the room, and humidity is raised by a fine spray of water. The walls of all the rooms have cavities filled with tin slag wool, and the ceilings are similarly insulated.

After less than a year in operation the average yield is about 1·4 lb./sq. ft. and is rising steadily. Mr. Derks has a very modern farm, is progressive in his ideas, and was extremely helpful in giving figures and answering questions generally.

On the same afternoon we visited the Institute of Horticultural Engineering at Wageningen, directed by Dr. E. W. B. van den Muijzenberg. There we saw the air conditioning and recording equipment used in their research work. There are in one building several rooms which can be used for mushroom growing, bulb drying and conditioning, or storage. In each of them thermocouples can be placed anywhere in the air or in the materials in use in the rooms, and a continuous record of the temperatures is taken on a chart in the control room overhead. Air can be circulated through the rooms by means of fans, and this can be heated by steam radiators, cooled by cold water, or humidified, with provision for measuring the heat put into the air or taken out of it. The walls have three structural layers and two cavities, with a number of panels for testing insulating materials by recording electrically the temperature at each surface and in the interior of the wall.

The visit to this splendidly equipped Institute ended with a tour of their permanent Exhibition of machinery, equipment, and materials of all kinds used in horticultural buildings and cultivation. Here are collected for the benefit of students and prospective users, specimens submitted by manufacturers and approved by the Institute after trial. The exhibits include a wide range of building and insulating materials, paints, heating equipment, tractors and tools.

We were entertained to tea, when Dr. Willam and Mr. A. DeB. Hovell thanked Dr. van den Muijzenberg and his colleagues for arranging such an interesting visit.

A short meeting followed, at which Dr. Willam and I explained to the members present the arrangements which were being made for publication of the communications presented to the Conference.

It was proposed by the Count Alvise da Schio, seconded by Mr. Hovell, and agreed by those present, that instead of receiving a free copy of the Conference Proceedings, all members should be asked to buy it. This would give an additional sale of about 100 copies and would help towards paying the costs of publication.

On the final day of the Conference we visited two mushroom growers

in Brussels. M. van Ginderachter has a group of underground cellars specially built for mushroom growing in 1903, on three floors. He grows partly on shelves and partly with ridge beds on the floor, and is in the process of modernising his plant.

The other grower, M. Willimeau, has 2½ acres of cellars under the abattoir of Brussels, where he grows on ridge beds by traditional methods used in the Belgian caves. These cellars were notably cool.

In the afternoon we went to the Field Station of the Belgian Chemical Union, to see their laboratories and field trial grounds where horticultural products made by the Union, particularly insecticides and fungicides, are tested. There were no mushrooms, but many other crops were being grown and we were treated to a particularly well conducted tour of an interesting variety of experiments.

So ended our Second International Conference, acclaimed a success by all concerned. We came home tired but satisfied, and looking forward to the next.

To maintain continuity of style, the Conference Proceedings will be published at Yaxley again, as *Mushroom Science* 2, and a permanent office has been set up at the Mushroom Research Station there, with **Mr. Fred. C. Atkins** (Britain), chairman; **Dr. A. Willam** (Belgium); **M. Andre Sarazin** (France); and **Dr. R. L. Edwards** (Britain), honorary secretary, forming a Permanent Standing Committee.

For each future Conference this Committee will work with leading figures in mushroom growing and research in the country where the Conference is to be held. **An invitation to Paris in 1956, extended by the French Federation, has been accepted.**

The Cape Asbestos Co. Ltd., of 114/116 Park Street, London, W.1., have published a booklet about their incombustible asbestos insulation board, *Asbestolux*, which will be of interest to mushroom growers planning extensions to their plant or its renovation.

COMBINED PUBLICITY IN U.S.A.

What is a one-dish meal combining canned peas, mushrooms, salmon, and biscuit mix or flour ?

It is a " Regal Roll Up," according to the Can Manufacturers Institute. What's more, CMI is joining with the Associated Independent Canners and the canned mushroom and salmon industries in a full-scale October promotion of the mixture.

Consumer publicity, aimed at media reaching 65,500,000 persons, will include picture stories, articles, mat coverage, recipe features, and radio and TV scripts.

Point-of-sale materials will be made available in abundance. Some 50,000 complete kits of store posters, stack cards, recipe leaflets, dispensers, and shelf strips can be had with brand imprinting from AIC direct.

A consumer advertising campaign sponsored by members of the promotion is now in the process of formulation.

New York Journal of Commerce, 18.8.52.

My Favourite Recipes

5.—Mrs. Olive Berry

May I offer three suggestions for the use of Mushrooms? Recipes No. 1 and 2 have proved favourites at small parties—especially with young people who are too old for tea parties and want something a little more grown-up.

Recipe No. 1.

This can be prepared the day before.

Mushrooms—preferably 1½" cups
Brown bread cut in 1½" strips or width of mushrooms selected
Aspic jelly
Chopped parsley to decorate

Method.

Remove the stalk from the mushroom and chop evenly across, keeping the oval shape of mushroom. Fry gently in minimum of fat. Remove from pan and place 4—6 slices neatly on strip of brown bread. Using a teaspoon, pour a small quantity of aspic jelly (just sufficient to keep them firm) on the brown bread. Leave to set. Sprinkle with parsley or garnish with tiny strip of ham or small sections of tomato.

Recipe No. 2.

½ streaky rasher and 2 button mushrooms per person

Method.

Roll ½ rasher tightly, place button mushroom either side, and secure firmly with a cocktail stick. Place in good medium oven for about 10 minutes. Serve hot.

Recipe No. 3.

The Berry Family's favourite way of serving a small mixed grill (not unlike American double-decker sandwiches). Portion per 1 person:

1 square of fried bread
1 rasher of bacon
1 large flat mushroom
1 tomato
1 egg

Method.

Cook all ingredients the usual way, making quite sure to keep the mushroom unbroken, the egg fried in really hot fat so that it is neat. To serve, place the golden brown fried bread on a hot plate, place the bacon crosswise, then mushroom on top, finally putting the fried egg on the mushroom—hence the need for a large mushroom. The fried tomatoes add colour and flavour placed either side of this tempting dish.

The Editor would very much appreciate it if members or their wives would send him their favourite mushroom recipes for this series.

Stanley Middlebrook's Diary

May 12. If you are one of those who set great store by careful and accurate temperature recordings you will ask for reliable thermometers. Can you get them? I've just had a batch of new ones delivered from one of the well-known makers. When tested in a bowl of hot water, the sensitive point of the thermometers touching each other, no two gave the same reading. The higher the temperature the greater the variation between them. Long experience of modern *precision* thermometers teaches that one cannot hope to get critical readings to within at least 5 degrees !

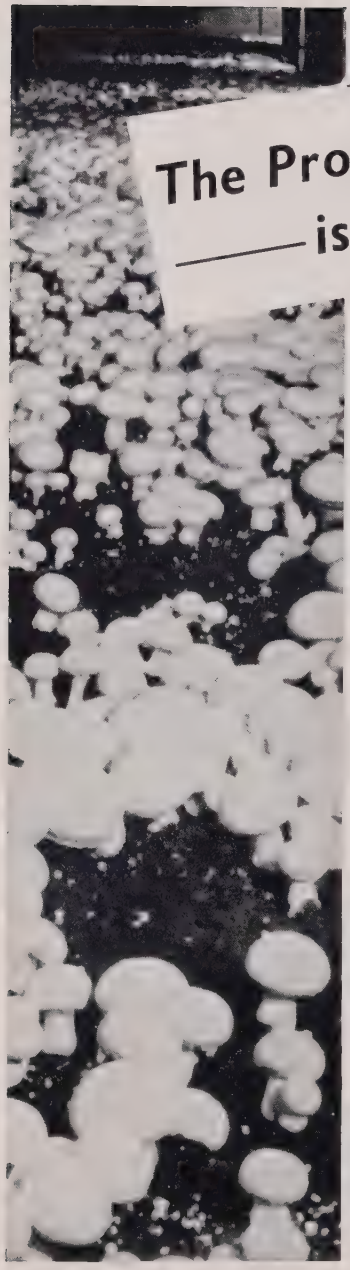
May 17. We have been surprised to find quite a few spots of *Mycogone* in peat/vermiculite casings -even in houses where there was no ordinary soil anywhere near. Where does the disease come from? The peat? Don't let it be said that we have to start sterilizing peat now.

June 16. After mildly reprimanding one of my boys for some minor fault I was faced with this proposition, " Of course you never do anything wrong, Dad." " Really," I said, " Come with me." And I showed him my production charts for the last 18 years and pointed out the many flops. Then I showed him round the place, pointing out the many mistakes in design, plan and construction. Next I took him into a house and showed him a bad spawn run. I showed him several pieces of useless equipment—white elephants. Finally I took him into a tray house and asked him to see if there was any disease on the bottom trays. " Hm," he observed, " perhaps you do . . . . . "

June 19. By some misfortune a number of trays (open brickwork), cased 5 days, fell down so that one sat directly on top of another, as during the peak heat arrangement. They must have been like this about 24 hours. When we found them the spawn was a mass of cotton wool on each tray surface and the compost temperature over 110° F. A few hours later, after re-erection to open brickwork, the temperature was down to 98° F. and the surface mass had vanished—without any other treatment than air. What will happen to these trays? No prize for a correct answer.

June 26. It may be a far cry from a tennis lawn to a mushroom price chart, but perhaps not so far as one may think. When my lawn sprouts fungi (mushrooms, toadstools and other ranks) I deduce that nature is working in the same way in many meadows. "Ah," say I, " field mushrooms again—lower prices." The heart sinks.

June 28. I hear that quite a few people are still rushing into this " profitable " mushroom business, some in a big way, some in a small. This is quite surprising. One could understand it during the high price period after the war, but now? Surely! Quite a few growers are recording prices down to the 1939 level which except in very few cases means they are selling at a definite loss. It will be argued that it is a temporary summer drop, that mushroom sales are depressed by the flushes of soft fruit now flooding the markets. Undoubtedly that is largely the explanation, but our graphs show that the rot set in much



The Proof of the Spawn is in the Cropping

A WELL-KNOWN SOUTH OF ENGLAND GROWER WRITES:—

"Against six other varieties of spawn, growing under the same conditions, and following the same methods of composting, and using the same casing soil, Darlington's 100% *Spawn gave from ·4 lb. to ·5 lb. betterment per sq. ft."*

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earlier than usual—before tomatoes, soft fruit, etc. were even ripening. In fact the chart level from January to June is about 7d. down on the same period last year and the summer drop is even worse than last year. With rising costs many established growers are going to have a bad season. One can only pity those who still think there is a fortune in mushrooms and rush into it while the going is good. But " going " can have two meanings.

June 30. Following the cold wet snap round about Coronation time spawn grew slowly and seemed to have no life in it. This inactivity did not, however, apply to moulds which appear to have leaped ahead of the spawn with disastrous results. I wonder if this has been a common experience. We feel that had we put on artificial heat the trouble would not have occurred, but in June one argues that " tomorrow must be warmer and the pipes would overheat the houses."

July 1. Dr. Sinden is reported—accurately as I believe—to have made the following statement at the Gembloux conference: " We (i.e., he and Mrs. Hauser) have never talked or written about triangular piles." This shook me. If Dr. Sinden didn't tell me about them who did? Why, immediately after his visit here, did I adopt a triangular method of stacking in conjunction with short composting when the idea had never previously entered my head? The world now knows that my cropping improved as a result of short composting and that an essential part of *my* short composting is the triangular stack. I have given all the credit to Dr. Sinden for what I've always considered to be his suggestion. My adaptation helped, but the idea was his. Very well, if Sinden doesn't accept that, I can only conclude that the idea of triangular stacks must have been the product of my own fertile (if semi-conscious) brain. So in future, if your triangular composts fail, you will blame me and not Sinden. I can take it—if he can't.

July 2. It is common knowledge that when visitors come round there is nothing to show. " There was an excellent show yesterday and there will be full beds next week, but to-day . . . . . we're sorry . . . . . just one of those things, y'know." This happened to me to-day. Not only was there nothing to show my visitors but, crowning indignity, all the picking staff were out and about the yards—weeding!

July 6. I am amused at the antics of E.H.P., R.L.O.J. and F.C.A. in their efforts to secure for themselves a maximum profit (see article, this issue). Those people who like figuring things out in the evening—or during the day if they're not busy enough trying to grow mushrooms—enjoy deluding themselves and others by much planning, graphing, paper work, forecasting and so on, but in all their scribbling and doodling they appear to ignore the erratic nature of the mushroom and the flexibility required to cope with it. You can do anything on paper but you can't schedule or plan mushrooms out of a compost with a bad spawn run in it. You can't forecast anything (except on paper) with mushrooms. I prefer the practical method of making the most of every house in every way and adapting one's programme to the needs of each day. For instance, if a compost is prepared for house 9 and the next rotational house, 10, packs up earlier than 9, the compost would be switched to 10, and later 10's compost would go into 9. This upsets the

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rota, the routine, and the prediction graphs and figures, but mushrooms are not lost and the cheques keep coming in. What else matters? The principle should be to see that every house is producing mushrooms at a satisfactory rate for the maximum number of days a year. The process demands a good deal of juggling, switching, changing, and a daily assessment of the position, also a vigorous disregard of any long-term planned programme. Each crop should be judged on its merits, not on its graph. Now, my masters, shoot!

Norman Cooper insists that . . .

TRAYS CAN LOWER COSTS

If my reply to Stanley Middlebrook's Diary remarks of 31st March regarding my article on *Initial Capital Cost* is somewhat belated, it is only because I realize that, of all growers, he will remain unconvinced.

There is no real proof, for instance, that picking on trays is quicker than beds as it depends on many things besides the actual operation of picking. These, such as bed width, height of tiers, tray size, height of stacking, and method of lighting, all contribute to the general pattern; and I implore him, therefore, not to be too emphatic that bed picking is quicker.

In the article I purposely, for ease of comparison, chose the same dimensions of house both for the bed and tray systems. But a tray house should have a ceiling height of not more than 7′, with the top tray some 12″ from the ceiling. This would mean a somewhat longer house than 36′ to accommodate 1,600 sq. ft. but, overall, construction costs for both sizes remain much the same. To pick from trays 6′ high needs, at most, a small stool which is a far simpler thing to handle than a ladder.

The lowering of production costs is of the greatest importance to the industry at the present time, and I would welcome thoughtful discussion on this.

It is my own belief that the tray system offers the greatest opportunity for the lowering of costs by reason of its manœuverability. This is apparent even on a small scale, and would be more so the larger the plant became.

Mr. Middlebrook comments as follows:

There is such a thing as *blind* conviction, and a blind acceptance of the untried.

If I remain unconvinced it is because the facts and figures of three years of comparison fail to produce the evidence that would justify a wholesale conversion to trays in the type of house to which Norman refers, and which we use.

I agree there is no *proof* that it is quicker to pick from shelves, but every picker on our staff supports my statement. We don't require proof; the fact is self-evident. Of course if trays are laid out as shelves, there would be no difference.

Manœuverability suggests movement, and movement increases costs.

I wonder if Norman has actually made all the necessary comparisons of capital and running costs. Has he obtained from his own experience facts and figures of the two systems from, say, two or three years' production by both methods running concurrently—the only fair way to form an opinion—or is he just making wishful-thinking statements in support of an illogical preference for trays?

What sort of authority does he claim for the fantastic statement that a tray house ceiling should only be 7′ high? If you're going to cram trays into houses that way of course you can cut initial building costs. The wise grower aims at more air space, not less!

In short, Norman continues to ignore the "total" aspect of the Tray System and picks out piecemeal some features which taken by themselves may seem to favour trays. In this way one could make out a very good case for commercial production in open meadows. Neither ladders nor bottom-tray-lumbago would help there!

MRA Annual Report

The **MRA Report for 1952** has just been published and is obtainable from the Mushroom Research Station, Yaxley, Peterborough, for 5/-.

During 1952 the study of casing soil was extended from the laboratory examination of soils and some artificial mixtures to their use on mushroom beds on a small scale—work which led to the publication this year of several formulae for " synthetic casings " more productive than the poor soils with which many growers have hitherto had to be satisfied.

It is hoped to review this Annual Report in our September issue, but those who wish to study the ways and means by which scientists do their research work, and like to learn all they can of the behaviour of the cultivated mushroom, will no doubt purchase a copy for their bookshelves at once.

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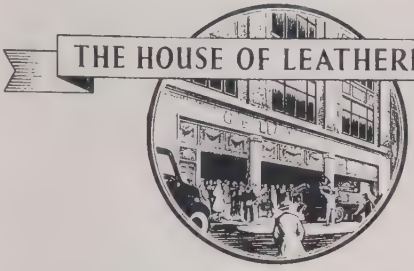

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from whom Schedules for the Competitions can be obtained

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